

# OPERATING MANUAL

## DESKTOP LARGE SHAKING INCUBATOR

MODEL : NB-205L & LF



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# 1. SAFETY

## 1.1 General Information on Precaution

- Precaution is to prevent the possible accident or danger during operation. So, you must keep it.
- Precaution is divided into caution and warning. And, each of them has following meanings.



Warning

If you don't keep this warning, you can get an accident or a fire.



Caution

If you don't keep this caution, you can get injured as well as a property loss.

### 1.1.1 Safety warning symbols



Warning

Caution

Compliance

Prohibition

No disassemble

Remove plug

Ground

## 1.2 Precaution for using the power cable



**Caution**



Compliance

Do not make the power plug be pressed by back of the product.  
(A space between the product and the plug must be 30cm at least.)



Compliance

The power outlet must be only for this product.  
(Using various products simultaneously can cause a fire)



Compliance

Clean the power plug with a dry towel and connect it properly.  
(Foreign substances or unsafe connection can cause a fire.)



Prohibition

Do not over bend the power cable and do not make it to be pressed by heavy products.  
(When it is damaged, it can cause a fire.)



Prohibition

Do not touch the power code with wet hands.  
(It can cause an electric shock.)



Prohibition

Do not use the damaged power code and outlet.  
(It can cause an electric shock and a fire.)

Remove  
plug

When you see smoke comes out from the product or smell something is burning or see any other strange symptoms, you have to pull out the power code and stop using it.  
(It can cause an electric shock and a fire.)

### 1. 3 Precaution for ground connection



Compliance

Please ground before use the product, if you don't ground, you can get an electrocution when malfunction or an electric leakage occurs.



Compliance

At the place where you can't ground,

\* Please buy the equipment to prevent any electrical leakage.

\* An electric shock, an electric leakage and a fire can be occurred without an electric leakage breaker.



Prohibition

Do not ground to these places; Gas Pipe, water pipe, pipe, lighting rod, telephone wire etc.

\* Wrong ground connection can cause electrical leakage which eventually results in fire.



Compliance

If you don't have the outlet for AC 220V, then bury it under the ground after connecting the ground line to copper plate.

\* No ground connection can bring an electrocution, an electric leakage and a Fire.

### 1. 4 Precaution for use



#### Caution

No  
disassemble

You must not disassemble, fix and remodel the product by yourself.

(You can damage the product throughout a fire and malfunction or get a property loss as well as experimental loss.)



Prohibition

Do not use the product for different purpose.








(It can cause malfunction or poor function. Consequently, you will get a wrong result.)



Prohibition

Do not use an inflammable spray near the product.



(The switch and other electric connection parts can cause a fire.)

-  When you use inflammable substances such as benzene, thinner, alcohol and LP gas, please be careful. (It can cause a fire and an explosion.)  
Prohibition
-  To prevent water and experiment material from going into the control panel during the experiment, make sure to clean the control panel with a dry cloth.  
Compliance (It can cause an electric leakage and a fire.)
-  Do not wash the product with excessive quantity of water, thinner, benzene and Petroleum. (It can cause an electric leakage, and malfunction or damage on the surface.)  
Compliance
-  When you don't use the product or clean it, please pull out the power plug.  
Compliance (It is to prevent an eclectic leakage.)
-  Open and close the door softly and please use a door knob.  
Compliance (A heavy shock can damage the product and breakdown the operating part. Also your hands can be stuck between the door and body.)
-  Do not detach the built-in lamp and electrical devices.  
Compliance (It can cause an electric shock and a fire.)
-  Please be sure to prevent foreign substances from getting into the sealing silicon of the door. (The inflow of open air can cause the change of temperature in chamber and discoloration of the packing part by a foreign substance.)  
Compliance

## 2. TRANSPORTATION, STORAGE AND LOCATION OF INSTALLATION



### 2. 1 Transportation

-  DO NOT try to slide or tilt the unit  
Prohibition
-  Lift the unit at its four lower corners with the aid of 2 people.  
Compliance (Weight: 35kg)



Compliance

Permissible ambient temperature range for transport: -10°C to 60°C.

## 2. 2 Storage

Permissible ambient humidity: max. 70%



Compliance

**Please check the voltage & Hertz written on serial label.**

(Over-voltage, under-voltage can damage the product and poor performance.)



Prohibition

Do not install at a humid place.

(It causes an electric leakage accident and a corrosive of the product.)



Prohibition

Keep this product out of the direct ray of sun and do not install at a hot place or a place that is near an electric heat.

(The proper indoor temperature is 20°C ~ 30°C Humidity 40%~60%RH))



Compliance

Permissible ambient temperature range for transport: -10°C to 60°C.

## 2. 3 Location of installation and ambient conditions



Prohibition

Do not put inflammable substances near the product.

(It can cause a fire)



Compliance

When you install the product, you have to put the distance of at least 30cm from the wall. To completely separate the unit from the power supply, power plug must be disconnected. Install the unit in the way that the power plug is easily accessible and can be easily pulled in case of danger.



Compliance

Install the unit at a flat surface, free from vibration and in a well-ventilated Location. (If the ground is not flat, it can cause an excessive vibration of the product.)



Prohibition

When you move the product, do not lay down to its side or reverse the head to bottom. (It can cause a malfunction.)



Compliance

When you move the product, hold the door and other movable parts of the product with a tape. (When the product is moved, the movable door can cause injury of you and damage of the product.)



Compliance

When you move the product, you must hold up the product. (Pushing or pulling the product can damage the bottom part of the product.)

## 3. FEATURE AND SPECIFICATION

### 3.1 Features

- Artificial intelligence system  
Artificial intelligence system maintains precise temperature by using MICOM.
- Suitable for bench space  
Simple & convenient structure for experiment can be placed on testing bench.
- Precise temperature control  
Special design for convection allows precise temperature control.
- Automatic stop function  
When the cover is opened, it automatically stops for safety and convenience.
- Artificial intelligence system  
Artificial intelligence system maintains precise temperature by using MICOM.
- Once-piece construction with acrylic cover  
Trans-parent acrylic cover provides wide observation during experiment.  
Brushless DC motor provides low noise and no vibration.
- Illumination function  
Lamps can be used for Photosynthesis experiment.
- Watch dog function  
Unexpected stop occurred by power failure or somebody is shown to the users.

### 3. 2 Specification

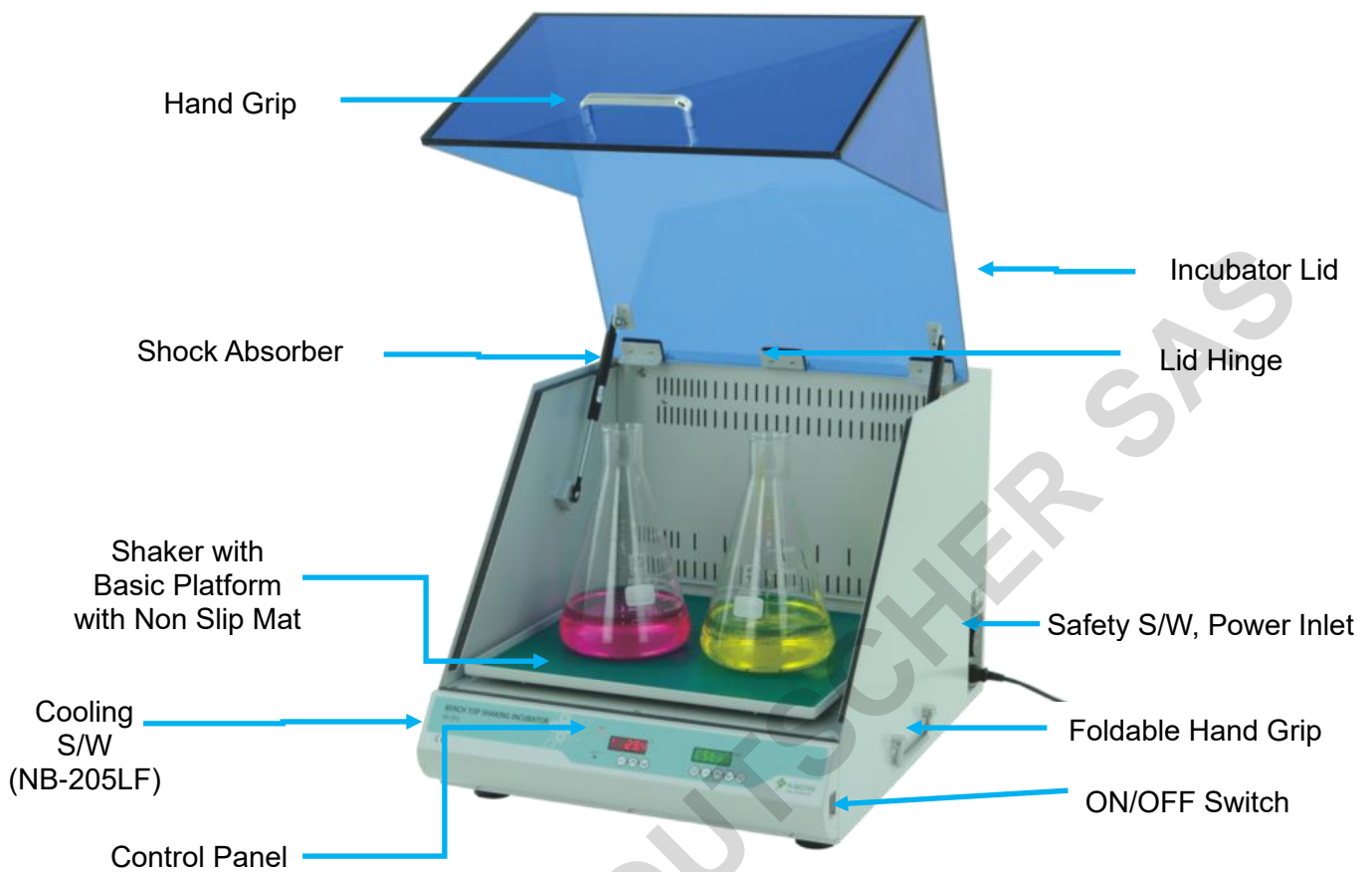
Items	Unit	NB-205L	NB-205LF
<b>Temperature</b>			
range	°C	Ambient +5°C to 60°C	12°C Below Ambient to 60°C
accuracy	°C	±0.25°C at 37°C	±1.0°C at 37°C
increment	°C	±0.1°C	±0.1°C
control		Microprocessor digital PID	Microprocessor digital PID
<b>SPEED</b>			
range	rpm	30 to 300rpm	
accuracy	rpm	±1rpm	
increment	rpm	1rpm	
<b>Time</b>			
range		Continuous or up to 47h 59min	
accuracy		±1%	
<b>Motor</b>		Plate Type Brushless DC Motor	
<b>Drive system</b>		Beltless Direct Drive	
<b>Orbit Diameter</b>		22mm	
<b>Operating panel</b>		Touch Button	
<b>Platform size</b>	mm	450(W)x450(D)mm	
<b>Platform capacity</b>		100mlx36ea, 250mlx23ea, 500mlx16ea, 1000mlx9ea, 2000mlx5ea, spring rack, Microplate Rack	
<b>Chamber Dimensions</b>	mm	510(W)x500(D)x330(H)mm	
<b>Overall Dimensions</b>	mm	510(W)x600(D)x470(H)mm	550(W) x790(D)x555(H)mm
<b>Power</b>	V/Hz	110/220V, 50/60Hz, 450W	110/220V, 50/60Hz, 700W (Max. 2kW)
<b>Weight</b>	kg	56kg	78kg

### 3. 3 Control Panel



- ① Pilot lamp for heating signal  
When chamber is being heated, this lamp is lighting
- ② Pilot lamp for Overheating Safety Control  
When overheating is sensed by safety device, this pilot lamp is lighting.
- ③ Temperature Control Display
- ④ RPM Control Display

### 3. 4 Configuration



#### - General Notification about the Flask Rack

(Flask rack is not initially included in the package, to order the flask rack please inform the N-Biotek distributor when ordering the product.)

## 3. 5 Accessories

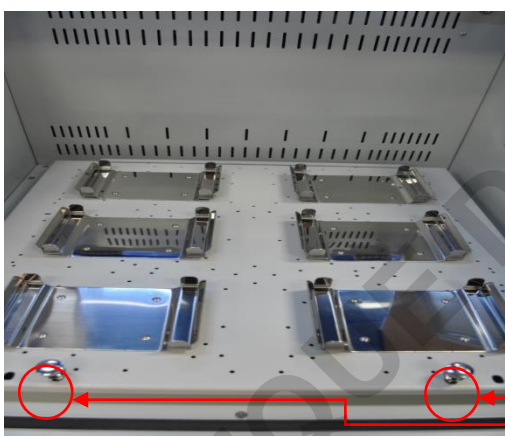
APPERANCE	NAME	SPECIFICATION
	NB-205LH10	36ea x 100ml Flask Holder
	NB-205LH25	23ea x 250ml Flask Holder
	NB-205LH50	16ea x 500ml Flask Holder
	NB-205LH100	9ea x 1000ml Flask Holder
	NB-205LH200	5ea x 2000ml Flask Holder (Only 5 holders are provided and directly mounted on basic platform without additional holder platform.)

	<p>NB-205LSR</p>	<p>Spring Rack Holder</p>
	<p>NB-205LMP</p>	<p>Micro plate Holder</p>

**3.5.1 Installation of dedicated platform and spring rack**

**Ex) Micro-plate holder platform.**

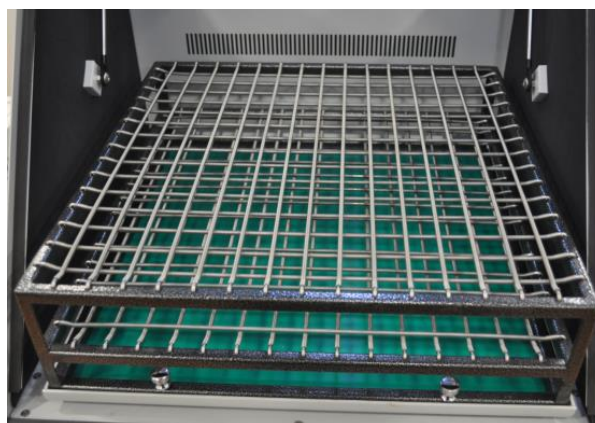
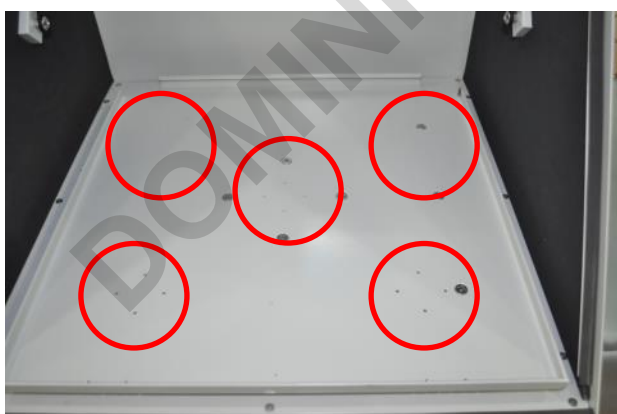
**\*All dedicated platform installation is same except spring rack and 2L flask holder.**



1. Carefully place the plate on top of the shaker from rear edge to front edge.

※ Note : the four edges of original shaker plate is slightly bent up vertically so insert the plate into this frame.

2. Fasten these screws by hand in clockwise direction.



In case of 2L flask holder, directly mount them on the basic platform. Place holder at above position where screw tap for 2L holders are made. (No additional Platform is Required)

Spring Rack is also mounted directly on the basic platform(which essentially provided as standard) Insert spring rack into the frame of base platform and fasten two screws in its screws tap at front.

## 4. INSTALLATION AND OPERATION

### 4. 1 Installation

- Choose a location that is free from rapidly changing temperature conditions (away from a heating or cooling vent).
- To assure proper ventilation and to prevent power cable from short circuit by bending, allow a minimum of 5 Cm of the clearance between the rear and side of the unit and the adjacent wall.
- Always ensure that the machine is installed on a level surface.
- Before plugging the machine into the outlet, ensure that the electrical specifications (listed on the serial number label on the rear side of the unit) matches the electrical specifications of your outlet.
- Always
  - Avoid a direct ray and light.
  - Avoid high humidity and dust air.
  - Avoid cool areas (below 5 °C).

### 4. 2 Operation

#### 1) Place the Power switch “ON” position which locate by fuse in back of machine

After turn on Main S/W, The digital readout will display as below.



(a) temperature display



(b) RPM and time display

\* Present temperature in the chamber display

\* Above message is Controller displayed at first

#### 2) Temperature Set-up

- (1) Place the Power switch “ON” position which locate in right side.  
Then, LED screen will displayed present temperature in the chamber.
- (2) Press the “SET” key, then LED screen displayed “Set-up” temperature and flicker continually.
- (3) Then, you can set-up the new temperature using UP(▲) and DOWN(▼) key as desired set-point temperature.
- (4) Press “SET” key again after set up the new temperature as desired set-point temperature, then LED screen will be stop to flicker and saved as new temperature.

**\*If low temperature set-up in NB-205LF model is required, turn on “COOL Switch” which located at front left side in front control box.**

**\*Do not use cooling function when only heating required. Use the cooling function to down the temperature below ambient. It may shorten the life time of cooling unit.**

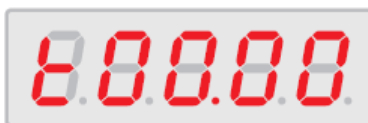
\* if you don't press “SET” key after set up the new temperature, new set-up temperature is not save at all.

\* Set-up temperature range of NB-205L(Heating Only) is ambient +5°C to 60°C.

**\* Set-up temperature range of NB-205LF is below 12°C at room temperature +25°C ~ 60°C.  
Lowest controllable temperature in incubator chamber is up to 13°C.**

### 3) Time Set-up

- (1) Press the "RPM/TIME" key during the approximately 1 or 2 seconds until LED displayed "T 00.00" as below.



- (2) Press the "SET" key. Then LED displays set time and can be set the time using UP(▲), DOWN(▼) key as desired set time.

At first, you can set the hour using UP(▲), DOWN(▼) key and press "SET" key.

You can set the minute using UP(▲), DOWN(▼) key after set the hour.

Press "SET" key again after set time (hour and minute), then LED displayed as "t SAVE" as below.



\* Time set point range is maximum 99 hours 59 min.

If you want to use this incubator continually, you must set value as 00:00.

### 4) Speed (RPM) Set-up

- (1) Press the "RPM/TIME" key approximately 1 or 2 seconds until LED blinks with current programmed RPM.



Warning

Don't set RPM below 30.

- (2) In this input mode, adjust RPM as desired using UP(▲), DOWN(▼) key and press "SET" key finally to save the adjusted RPM to be programmed.

\* RPM setting range is from 30 to 300.



\* If you do not press the "SET" key to store the desired speed the new speed will not be saved and the set speed will return to the prior setting.

\* You can also set RPM during shaking operation by pressing UP(▲), DOWN(▼) key without stop. In this case, no need to save the value as it will automatically adjust to new RPM value.

## 5. WARNING MESSAGES



1) This message may be displayed as to

- RPM is being set "0" or less than minimum RPM.
- Something forced not to move when the platform is moving.
- Solution : Use your hands to move platform and push "STOP" button simultaneously and than push the "SET" button to increase RPM you want.



2) This message may be displayed as to

- Momentary noise symptom.
- When the platform is being moved faster than RPM which you set.  
(This message may occur from 200 RPM)
- Solution : These symptom will be recovered automatically within 3 min or restart it.



3) This message may be displayed as to

- Finish operation after "TIME" Setting Mode.



4) This message may be displayed as to

- The electricity is on from power failure during "TIME" Setting Mode.
- Solution : Push the "START" button once again.



5) This message may be marked as to

- The electricity is off during operation.
- Solution : "n"(new record) will be changed to "r"(RPM) if you push "START" button.

## 6. SERVICE AND CHECK POINT



Service should be only performed by qualified service personnel

Before replacing any electrical or mechanical components, disconnection unit from its electrical power source. If electrical power is required for service exercise extreme caution as LINE VOLTAGE is present.

1) Unit is not working (Check below before thinking this as malfunction)

(1) Electrical connection

Please disconnect main power cable and then reconnect.

(2) Voltage supply

Please check to voltage.

(3) Fuse check.

(4) Verify voltage on unit.

(5) Defective power switch (check voltage at switch)

Please contact N-BIOTEK Technical Service or your local retailer for any enquires and Service issues.

Thank you for purchasing our Shaking Incubator.

This operation manual describes practical information such as performance, usage, and cautions and notices for use of the product. Prior to using the product, please read it carefully all the safety instructions described in this manual and keep this manual near equipment.

## WARRANTY

<b>ITEM</b>	Desktop Large Shaking Incubator	<b>MODEL</b>	
<b>DATE OF INSTALLATION</b>	mm-dd-year	<b>SUPPLIER</b>	
<b>SERIAL NO.</b>		<b>PERIOD</b>	1 year

**N-BIOTEK** provides a warranty on all parts and factory workmanship. The warranty includes areas of defective material and workmanship, provided such defect results from normal and proper use of the equipment.

1. The free warranty service will be provided once the unit is proved to be defective by wrong workmanship after N-BIOTEK or reliable distributor's examination.
2. The warranty period is 1 year from date of installation or 16Month year from the date of shipment from N-BIOTEK, whichever is sooner as indicated in above table. This period is proved by serial no.
3. N-BIOTEK will not be responsible of free warranty service for the faulty caused by user's improper operation, excessive use, use of incorrect voltage & frequency, storage in wrong environment mentioned in Manual.
4. Complete the above table after installation and keep this card. Then, present it to a dealer or N-BIOTEK when warranty repair is needed.

Signed By



President Daeyong Kim  
N-BIOTEK, INC.